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PAPERS
IN
POLITE ARTS.

THE SILVER ISIS MEDAL *was this Session voted to Mr. C. PYE, of No. 27, Euston-place, Euston-sq. for preparing Charcoal to answer the purpose of Black Chalk for Drawing. The following Communication was received from him, and Specimens of the Charcoal are preserved in the Society's Repository.*

SIR,

HAVING prepared charcoal to answer the purpose of black chalk drawing, I forward, for the inspection of the Society, a few specimens, and should be highly flattered if they meet the approbation of the Institution.

I am, Sir,

Your obedient humble Servant,

CHARLES PYE.

No. 27, Euston-place, Euston-square,
17th November, 1815.

To C. TAYLOR, M.D. SEC.

K

SIR,

SIR,

YOUR reply to my communication to the Society relative to *prepared Charcoal for drawing* demanded a more satisfactory answer than I was enabled to send, from the short time allowed me to reply to your letter. At that time I was not prepared with such experiments as I wished to forward, and, on that account, I was induced to wave the subject until I could furnish the Society with pencils made from the preparation. I have now the pleasure to enclose some specimens, which I hope will be deemed satisfactory, accompanied with an account of the process of preparing the charcoal.

I was led to this discovery from the difficulty of preserving *black lead sketches and drawings*; and, from frequently experiencing great inconvenience from their being rubbed and obliterated.

Charcoal prepared in this way appears to me to answer the purpose of lead, where it is requisite to be permanent, not only in making drawings, but in writing memorandums also. Should the Society require any further information on this subject, it will be communicated with pleasure, by your

Obedient humble Servant,

CHARLES PYE.

No. 27, *Euston-place, Euston-square,*

March 25th, 1816.

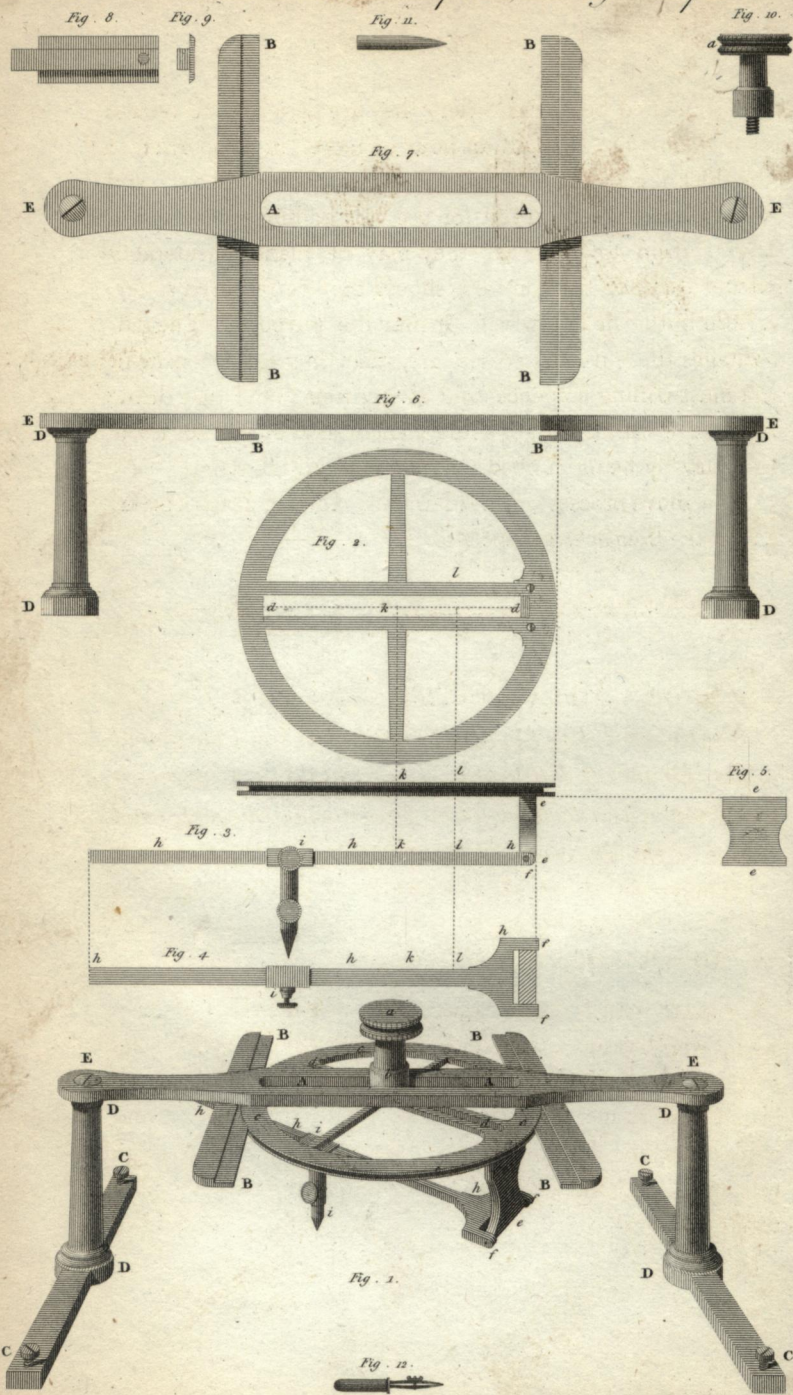
TO C. TAYLOR, M.D. SEC.

The Method of preparing the Charcoal.

THE finest grained charcoal that can be procured is sawed into slips of the size and form required, and put into a pip-kin

M^r W^m Cubitt's Instrument for Drawing Ellipses.

Pl. 8



Drawn by M.A. Nicholson.

Engraved by J.B. Taylor.

kin of melted bees'-wax, where they are permitted to remain near a slow fire for half an hour or more, in proportion to the thickness of the charcoal; they are then taken out, and when perfectly cool, are fit for use. By adding a small quantity of rosin to the wax, they may be made considerably harder; and, on the contrary, should they be required softer, a little butter or tallow will answer the purpose. The advantages these pencils possess are, that they can be made at the most trifling expence, and at any time; and that drawings made with them are as permanent as ink, and not liable to injury by being rubbed, or remaining in the damp.

The above process will harden both red and black chalks, and make them permanent also.

The SILVER MEDAL was this Session voted to Mr. WILLIAM CUBITT, of Ipswich, for an Instrument for Drawing Ellipses. The following Communication was received from him on the Subject, and one of the Instruments is preserved in the Society's Repository.

DEAR SIR,

A PARTICULAR friend of mine, Mr. W^M. CUBITT, of Ipswich, who has more than once distinguished himself by the excellence and simplicity of his contrivances, has sent a little instrument to me for the purpose of drawing circles and ellipses, or engraving them on copper, which he proposes to call an *Ellipsifex*, and at the same time requests me, (if I thought it worthy of notice) to forward it to the Society of

K 2

Arts,

Arts, Manufactures and Commerce, who have at all times shown their forwardness to patronize any thing which might tend to improve or simplify the useful or Polite Arts. I am myself so much pleased with the simplicity of its construction, and the accuracy of its performance, that I do not hesitate to send it for the inspection of the Society. It will be seen that an ellipses can be drawn upon the paper with great facility, by merely making a right line in the first instance for the transverse axis, and laying the center of the instrument over this. If the center screw is placed in its greatest, or, indeed, any eccentricity, and the pencil immediately under it, the pencil, on turning the wheel, will be found to describe a right line. If, on the contrary, the center screw is placed in the center of the wheel, the pencil will describe a circle which may be diminished down to a point, without making any center mark, and hence the instrument is capable of describing every proportion of ellipse between the circle and the right line, and that to more extensive dimensions than any of the instruments I have yet seen. Such, however, as it is, I submit it to the judgment of the Society, and should they deem it deserving of their notice, I am sure Mr. Cubitt, the inventor, will feel himself much gratified.

Any communication addressed to me will be immediately attended to; and I am, dear Sir, with great respect,

Your's, very truly,

JOHN MILLINGTON.

Upper Mall, Hammersmith, 29th April, 1816.

TO C. TAYLOR, M. D. SEC.

Referenc

*Reference to the Engraving of Mr. WILLIAM CUBITT'S
Instrument for Drawing Ellipses. Plate 8.*

Fig. 1, Is a general view of the Instrument, consisting principally of a frame, wheel, and arm, for carrying the pencil, tracer, or pen. The whole being supposed to be placed upon a table or drawing-board, may be thus described, C C, C C, feet of the frame, which are placed in parallel lines longitudinally upon the table or drawing-board.

D D, D D, turned pillars of brass, firmly fixed to the feet C C, C C.

E E, a horizontal beam with a groove A A, fixed to the tops of the pillars D D.

B B, B B, guides, each consisting of a brass bar and a steel plate, attached to the horizontal beam E E; the straight edges B B, B B, of the steel plates being parallel to the feet C C, C C; or to the table; and at right angles to the longitudinal middle of the beam E E; c c c, a wheel, grooved on the edge, so as to fit and slide upon the steel plates B B, B B, and to move freely and exactly thereon, so that the centre of the wheel may be compelled to describe a straight line parallel to the table or drawing board, and at right angles to the longitudinal groove or slit A A, in the beam E E.

The arms of the wheel are placed at right angles to each other, and one of them is made double, so as to contain a groove d d, in which is inserted a slider, made to fit the groove exactly, and move freely therein.

a b, a handle, consisting of a milled head a, and turned pillar b, made to fit the slit or groove A A, in the beam E E; and having a screw at its end, which may be screwed into

the slider at pleasure, and make it fast in the groove $d d$, of the wheel.

$e e$, a vertical piece of brass, firmly attached to the under face or rim of the wheel, at one end of the groove $d d$.

$ff, h h h$, an arm jointed at ff , to the vertical piece $e e$, so as to move only in a vertical plane passing longitudinally along the middle of the groove $d d$, in the double arm of the wheel.

$i i$, a tube or case, to contain a pencil, pen, or tracer; made to slide along the arm $h h h$, and to be fixed by a milled headed screw; (which in this view, is hid by the rim of the wheel;) the tracer, when fitted in the tube, being of such a length, as when the point is resting on the paper, the arm may be parallel to the plane of the board; and the tracer, is fixed in the tube, by a small milled headed screw, shown at the lower end of the tube.

The parts of the perspective view of the Instrument being thus described; suppose then, the handle $a b$, is fixed in the center of the wheel; it is plain that when it is turned round with the wheel, the center will have an invariable position: but if it be fixed out of the center, it is evident, then, that the center will describe a straight line, parallel to, and equidistant from, the steel edges $B B, B B$, of the guides: and because the arm $h h h$, is in the same vertical plane with the groove $d d$, in the double arms of the wheel; and all the points in the longitudinal direction of the arm, fixed with respect to those which pass longitudinally along the said groove; there is therefore a certain point k , in the arm, $h h h$, in the same vertical line with the center of the wheel; and since the center of the wheel is always in a straight line parallel to the board or table, and at right angles to the beam $E E$; the said point k , in the arm will
also

also be in a straight line, parallel to the board or table, and in a vertical plane passing through the line described by the center of the wheel; and because the axis of the handle *a b*, is likewise in the line which passes longitudinally along the groove *d d*, included by the arms of the wheel, there will be two points in this longitudinal line passing along the groove of the wheel; the one which is in the axis of the handle *a b*, moving along the middle of the groove *A A*, of the cross beam *E E*; and the other, which is the center of the wheel, moving at right angles therewith, parallel to the board; and, consequently, the arm *h h h*, will also have two such points, moving horizontally; the one which passes through the handle *a b*, in a vertical plane passing along the middle of the groove *A A* in the beam *E E*; and the other, in a vertical plane, passing through the line *d d*, described by the center of the wheel; and as the horizontal section of these two vertical planes, are two horizontal straight lines, at right angles to each other; the one point of the arm *h h h*, will move in the one line, and the other point in the other line.

It is therefore evident, when the axis of the handle *a b*, and the center of the wheel are coincident, that every point in the arm *h h h*, must describe the circumference of a circle; but when these two points are separated, every point in the arm *h h h* will describe an ellipsis.

Fig. 2, the face of the wheel; *d d*, the middle of the groove, referred to in the general view.

Fig. 3, profile or edge of the wheel, shewing its connection with the arm *h h h*. From this figure, the method of setting the instrument, in order to describe an ellipse of any given dimensions, will be shown; thus, let *k* be the point in the arm *h h h* corresponding to the center of the

wheel which is here a fixed point; make kl equal to the difference of the two semi axis; l will then be the center of the handle ab , which ought therefore to be screwed at that distance from the center of the wheel in the groove dd , and also make ki equal to the lesser semi axis; and the instrument will then be set, so as to describe the ellipse.

It is obvious, that as the arm hhh , has no interruption upon it, the point i , may be made to coincide with k , by which means, the tracer will describe a straight line, which may be in length, the double of fk . In using the instrument, the milled head of the handle should be twisted round with the thumb and fingers, at the same time letting it obey the direction given to it, by sliding along the groove AA , in the beam EE , without impediment or hindrance.

N.B. In adjusting the instrument, the two grooves, namely the groove AA in the beam EE , and the groove dd , in the wheel, should be brought underneath each other, so as to be in one straight line; then move the handle ab , until its center shall be in the point l , fig. 2 & 3; when, its distance from the point i , in the arm hhh , will be equal to the semi-transverse diameter of the ellipse; and make the distance of the tracer, from the point k , equal to i , which will be equal to its semi-conjugate diameter.

Fig. 4, shews the top of the arm hhh , with the slider i , and the form of the joint at ff .

Fig. 5, the side of the vertical piece of brass, shewn at e , fig. 1.

Fig. 6, the horizontal beam, with the two pillars DD ; and the ends of the straight edges, or transverse pieces BB , along which the wheel slides.

The

M^r C. West's New Parallel Rule.

1

Fig. 1.

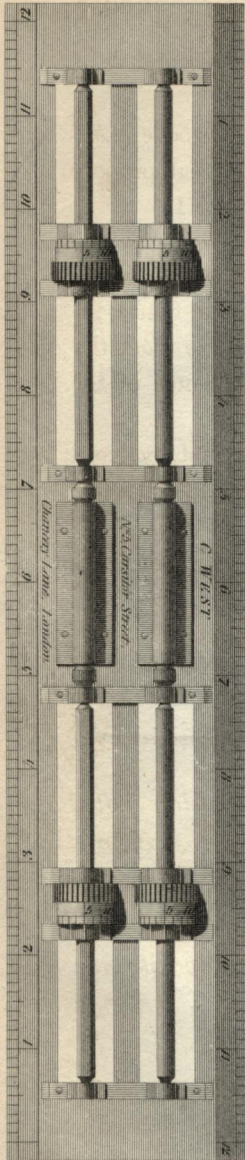


Fig. 2.

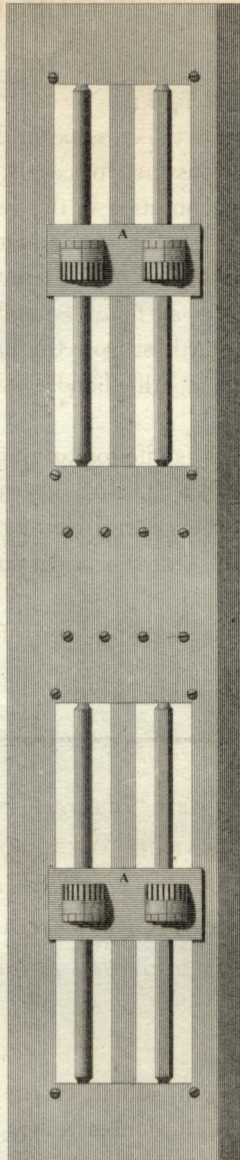


Fig. 3.

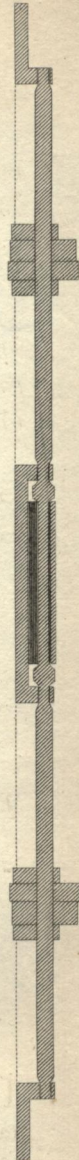


Fig. 5.



Fig. 4.



The steel plates shewn at *BB*, keep the wheel always in the plane of its face.

Fig. 7, shews the cross beam *EE*, with its groove *AA*; and the two transverse pieces *B, B*, in their real proportions: see its connection in the general view, fig. 1.

Figs. 8 and 9, the slider, with a female screw to receive the screwed end of the handle *ab*, its longitudinal direction is shown at figure 8, and its section at figure 9; when the end farthest from the handle is made to touch the rim of the wheel, the handle will be in the center of the wheel.

Fig. 10, the handle for turning the instrument by, consisting of a pillar *b*, with a screwed end, and a milled head, *a*; shewn in the general view fig. 1, at *ab*.

Fig. 11, the tracer or steel point, which will be useful upon copper.

Fig. 12, the drawing pen, for describing the elliptic curve with ink.

The SILVER ISIS MEDAL, was this Session voted to Mr. CHARLES WEST, of Cursitor Street, Chancery Lane, for a Parallel Rule. The following Communication was received from him, and one of the Rules is preserved in the Society's Repository.

SIR,

I AM anxious to submit to the Society an improved Parallel Rule, with double rollers, which may be shifted at pleasure, so as to make one rule answer the purpose of the
three

three commonly used : should this alteration be approved by the Society, I shall feel myself much flattered by any mark of their sanction.

I am, Sir,

Your obedient humble servant,

CHARLES WEST.

Gurkitor Street, Chancery Lane, April 15, 1816.

TO C. TAYLOR, M.D. SEC.

*Reference to the Engraving of Mr. C. West's new
Parallel Rule. Plute 9.*

Fig. 1, shews the top of the rule.

Fig. 2, the underside of the same. The double rollers placed in the parts A A, are considered to be of considerable advantage in the movement of the rule, so as to make it perform with more facility: A, A, sliders, in order to place the rollers at a greater or less distance from each other; as, by the greater distance, the movement of the rule is more to be depended upon; but when it is required, for want of room, as at the corner of a table, or drawing-board, for instance, to shorten the distance between them; the sliders will be found necessary, in order to accommodate the rule to such a situation.

Fig. 3, a longitudinal section, through the spindles.

Fig. 4, a transverse section through the rollers.

Fig. 5, a transverse section through the pivots.

Mr. Edm^d. Turrell's
Improved Drawing Board & T. Square.

Plate 10.

Fig. 1.

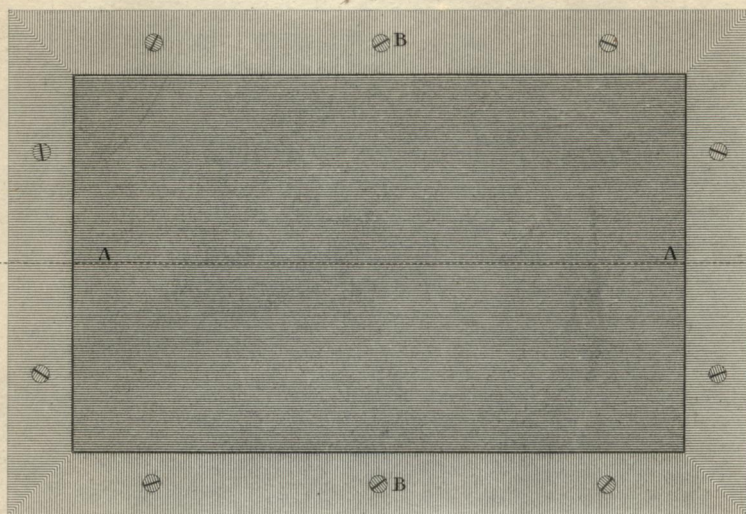


Fig. 2.



Fig. 3.

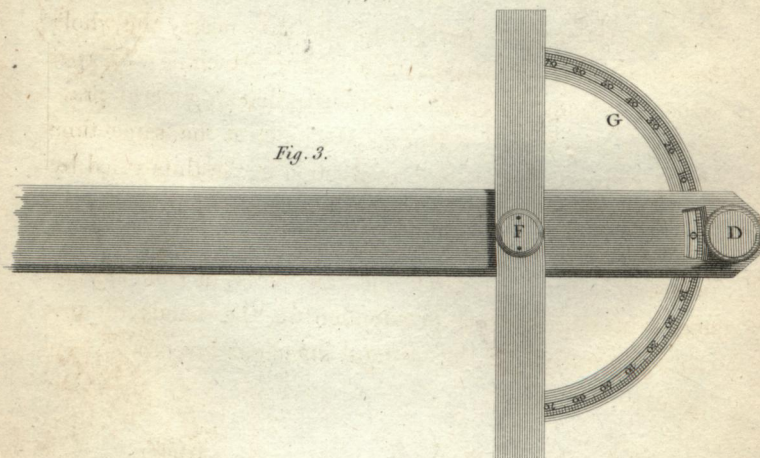


Fig. 4.



The SILVER MEDAL and FIVE GUINEAS, were this Session voted to Mr. EDMUND TURREL, of Gee Street, Clarendon Square, for a Drawing Board and T square. The following Communication was received from him on the Subject, and one of the Boards and T squares, are preserved in the Society's Repository.

SIR,

THE invention of Ruling Machines in the art of Copper Plate Engraving, produced such a degree of perfection in the tints ruled by them, that a corresponding degree of accuracy, was immediately required in all the other departments of the art, wherever the use of the machine was introduced.

But unfortunately for the credit of this department of the art, a most general opinion was directly formed, that engraving done with a machine required but little exertion in the artist to attain perfection, and that nearly the whole secret lay in the possession of a Ruling Machine:—Experience has most indubitably proved, that in general practice, the invention of a Ruling Machine, at the same time that it produced a portion of perfection in the tints ruled by it, never before seen, presented a degree of difficulty in the drawing and finishing department, such as had never been experienced. Indeed, such an excess of difficulty as might have prevented its adoption in the hands of any other person than that of its most ingenious inventor.

One

One of the most formidable difficulties which presents itself to an engraver of machinery and scientific subjects, is that of getting a correct outline tracing upon the copper plate. To effect this, transparent oiled paper (commonly called Tracing Paper), is used, for subjects of the free picturesque kind. But in plans, elevations, and sections of buildings, machinery, &c., such means are of little or no use; because, when such tracings are passed through the rolling press to transmit the outline to the copper plate, its unequal expansion while under the process of wetting, and likewise in its passage through the press produces, such a degree of error (especially when the Ruling Machine is to be employed) as to render such tracing completely useless.

To obviate this evil, the engraver has no other resource than to make a very correct outline reversed from his original drawing upon thin bank post paper, and having smeared the back with red chalk, carefully trace over each line, when the outline is laid down upon the varnished copper-plate.

I trust that it will appear evident from what has been said, that much will depend upon the nicety of the outline thus made, and as a means of ensuring accuracy of form, and delicacy of execution, I have found it necessary to improve the drawing boards for such purpose.

Whenever very thin paper is used for making outlines upon (and which is absolutely requisite in the case I have alluded to) considerable difficulty is found by the surface of the board giving way, wherever compasses are used for taking dimensions; but more particularly in all cases where a number of concentric circles are to be described from the same point, the large holes produced in the drawing rendering

dering it very unsightly, at the same time that all accuracy is destroyed by the centre hole frequently shifting into a hollow produced by the grain of the wood.

To avoid errors of this kind, I some years ago had recourse to a drawing board, covered with a plate of copper, which answered tolerably well, but when a point was pricked through the paper, it was scarcely visible, owing to the colour of the copper, which being reddish, rendered the dot, or puncture, very indistinct, while the surface was likely to have a very unpleasant oxyde produced upon it, owing to the necessity of stretching the paper while in a wetted state.

The Drawing Board which I have the honour to present, is covered with a plate of rolled zinc, which may be had of almost any dimensions, at Mr. Knight's, in Foster Lane, Cheapside.

As I have made use of Drawing Boards of this kind for nearly two years, I can speak with confidence of their advantages, and I can assure the Society, that to those artists who may be inclined to sacrifice a small additional expence, to obtain the means of making their drawings with neatness and accuracy, that they will not be disappointed if they possess a board of this description.

The advantages of zinc for this purpose I have found to be, that it is soft enough to admit of the insertion of a point sufficiently deep to be plainly seen, and yet hard enough to prevent the point from going to any considerable depth, so as to permit large holes to be made in the paper, and the drawing being complete, whatever holes are made in the zinc, may be burnished down by rubbing the thumb nail over them, which will sufficiently close them.

When oxydation of the metal takes place, it should be
suffered

suffered to remain, because being white, it helps to render the thin paper opaque, and consequently the lines drawn upon it, will be the more plainly seen.

When the sides of the frame of a drawing board are straight lines and nicely perpendicular to each other, parallel and perpendicular lines may be very correctly drawn with a good T square, but as wood is continually warping with every change of weather, accuracy cannot be expected from such imperfect means.

To prevent any error arising from this circumstance, I screw a solid rim of brass upon the upper surface of my frame, permitting it to project a small distance beyond the outer edges of the wooden frame, so that the stock of T square may slide against either edge. This brass rim being dressed very true and at right angles, will remain so for any length of time, as nothing but extraordinary violence can injure it.

I can assure the Society, that the present invention has sprung from necessity, originating in the very minute size of the engravings of the present day, added to which, a degree of accuracy is required, that can only be attained by a corresponding improvement in the apparatus, and for effecting such purposes. The zinc plate may be applied to a common drawing board, and the brass rim to the frame, therefore those persons who possess a set of drawing boards, may have them improved at a small expence. To enable the Society to appreciate the value of this improvement, I have inclosed some outlines which have been made for tracing upon copper plates, by a pupil, conceiving that ocular demonstration will have more effect in explaining its utility than a more elaborately written description.

The same objection that applies to the frame of a drawing

ing board, applies equally to a T square made with a wooden blade and fixed immovably to its stock, for if ever any injury happens to the fiducial or drawing edges, by a blow causing an indention, or by the wood warping through a change of weather, it must remain, because the blade being glued fast to the stock, does not admit of being corrected without considerable difficulty.

The square which I have the honour to present, is so constructed as to permit the blade to be withdrawn from the stock, for the purpose of correction, should any accident occur to it, and the same means which permit the blade to be removed for the purpose of correction and adjustment, enables the draughtsman to use it as a bevil at any angle, where it may be fixed by a clamp and thumb screw.

Should objection be formed to the weight of this invention, I beg leave to state that the same may be made in ebony or box wood, which would render it as light as a common square. The blade may be very easily set to a right angle by making it coincide with a line drawn on the arc for that purpose, where it may be fixed by the clamp.

Should any doubt arise as to the use of this improvement, I shall be happy to attend a Committee of the Society, to explain the difficulties that have given birth to it.

I am Sir,

Your most obedient servant,

EDMUND TURRELL.

No. 14, Gee Street, Clarendon Square.

To C. TAYLOR, M.D. SEC.

Reference

Reference to the Engraving of Mr. Turrell's Drawing Board and T Square. Plate 10.

Fig. 1, represents a plan of the Drawing Board and frame. The surface A A, shews the zinc plate, fastened round its edge with small copper pins, the heads of which are sunk and made smooth with the zinc surface. B B, represent the brass rim, made in one piece and screwed to the wooden frame of the Drawing Board by counter-sunk screws. The edges of this brass rim should be finished and set at right angles after it is screwed down to the frame.

Fig. 2, shews a section of fig. 1, taken through the line A A. In this figure it may be seen that the upper surfaces of the brass and zinc are so fitted as to be in the same plane. The small buttons C C C C, being formed like small wedges may be pressed into the grooves made in the frame to receive them. These, as a mode of fastening the board to the frame, will be found preferable to the wedges in common use, as they may be applied to a greater number of points, which will be found requisite when the board is large.

Fig. 3, shews a view of a T square with an adjusting blade, consequently it can be set to any angle and fixed to the arc G, by the thumb screw D.

Fig. 4, represents a section of fig. 3, in which the action of the thumb screw D, and the clamp E, may be more distinctly seen, as likewise the screw F, upon which the blade turns as a centre.

The screw F being withdrawn, permits the blade to be taken out, and the edges repaired, if they should receive any injury from wear or accident. The arc G, being divided into degrees, permits the blade to be placed at any angle where it may be fixed by the thumb-screw D.

The

M^r Allason's Perspectograph

Pl. 11

Fig. 6.

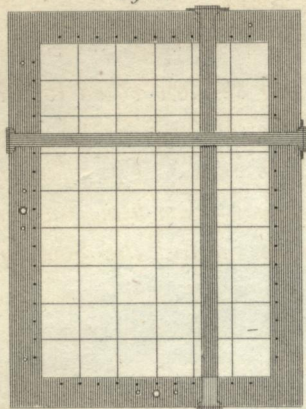


Fig. 5.

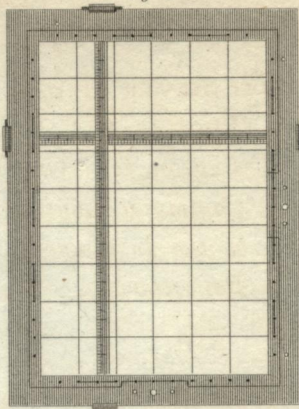


Fig. 4.

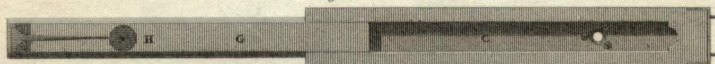


Fig. 3.



Fig. 2.

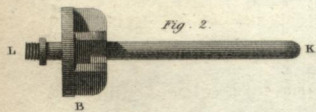


Fig. 1.

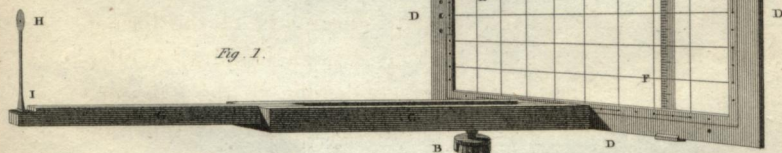
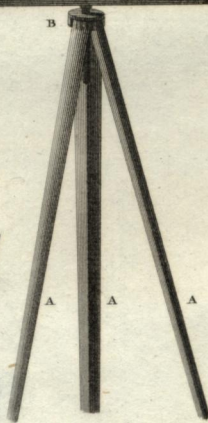
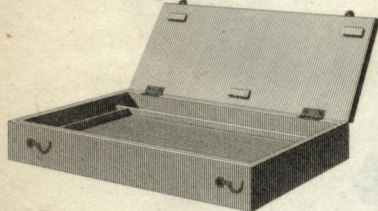


Fig. 8.



Fig. 7.



Drawn by M.A. Nicholson.

Engineed by J.B. Taylor.

The SILVER MEDAL, was this Session voted to Mr. THOMAS ALLASON, of Westbourne Green, Paddington, for a Graphic Instrument. The following Communications were received from him, and one of the Instruments is preserved in the Society's Repository.

SIR,

I BEG leave to communicate to the Society of Arts, &c., an invention of mine, which I consider may materially benefit and advance a knowledge of the Fine Arts in this country—“An Instrument for the correct and expeditious delineation of every description of objects.” The want of an Instrument of this kind is universally felt and acknowledged; many attempts have been made, and contrivances of great merit have resulted from the attention given to this important subject. In fact, we have numberless optical and mathematical instruments for this purpose, but the whole of them I conceive liable to many objections; of the former, the most in use are the common camera obscura, Wollaston's camera lucida, with its application to the telescope by Varley;—of the latter, there is a more considerable number, such as Maltrus, Ferguson's, Turrell's, &c., with others of great ingenuity, in the possession of private individuals.

To the first I principally object either from the want of portability, simplicity, &c., and what perhaps may not constitute the least object, their great expense; to the second I attach nearly the same objections, in addition to which their only ascertaining one point at an operation

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entirely

entirely precludes their being used, except by persons of considerable leisure.

The Instrument I have the honour of submitting for the consideration of the Society will be perhaps better understood from the accompanying model and drawing than from any description I could offer. I shall therefore confine myself to a general description. It principally consists of a metal frame, 9 inches by 6, having two graduated scales moving upon its surface, the one vertical to the other, for the purpose of finding both the horizontal distances, with the height and proportions of the different objects to be drawn to the lower surface; and at right angles with the frames is attached a small beam with a sight point at the other extremity, which can be lengthened or shortened agreeably to the quantity of objects desirable to be introduced in the drawing, and the whole supported by a triangle, forming a walking-stick.

I have enclosed two letters received from gentlemen of great professional reputation, and shall be most happy to attend, should the Society require additional information.

I remain, Sir,

Your most obedient humble Servant,

THOMAS ALLASON.

Westbourne Green, March 20, 1816.

TO C. TAYLOR, M. D. SEC.

DEAR SIR,

THE instrument which you have submitted for my opinion, is better adapted for taking perspective views from nature, than any that I am acquainted with. The scales
which

which you have introduced are admirably well calculated for taking any succession of points in the horizontal plane, or in a vertical line, by only moving one of the scales: this is a property, that neither Ferguson's, nor the late Instrument invented by Mr. Turrell can reach; as with them all points are equally difficult, but with yours all those situated in the same straight line are very readily ascertained; and even in the change from one line to the other at right angles, it is equally easy with theirs.

I am, dear Sir,

Yours sincerely,

PETER NICHOLSON.

Oxford Street, 18th March, 1816.

To Mr. C. ALLASON, &c.

DEAR SIR,

I CANNOT recollect having seen either a drawing or description of an Instrument exactly like yours, though it is probable the idea *may* have occurred before to some one.

It appears to me likely to answer more generally than any of the instruments in common use, and it is peculiarly well adapted to the purposes of travellers.

If I had a drawing to make of any very complicated object, I certainly would make trial of it.

Wishing you success, I remain,

Dear Sir, yours sincerely,

WILSON LOWRY.

Titchfield Street, 19th March, 1816.

To Mr. C. ALLASON, &c.

Reference to the Engraving of Mr. ALLASON's Perspectograph. Plate 11.

Fig. 1 is a general view of the instrument: A, A, A, B, a three-legged staff, for supporting the whole: A, A, A, the legs, jointed at B: C, a square horizontal trunk, with a brass socket in the bottom of it, by which it is screwed to the legs: D, D, D, D, a vertical brass frame screwed upon the end of the trunk, and pierced round the inner edges for the threads, which form the reticulated aperture, to pass through; the aperture being six by nine inches, and the horizontal threads being five in number, and the vertical ones eight, divide the whole aperture into 54 square inches: E, E, a thin slip of brass, bent at the ends, so as to slide freely on the outer edges of the brass frame, in order to be set parallel to the inner horizontal edges of it, at any distance from either edge: F, F, another vertical thin slip of brass, made to slide on the outer horizontal edges of the brass frame, in the same manner; the slip *e, e*, is divided into nine equal parts or inches; and *f, f*, into six inches; and each inch is subdivided into twelve parts, for the greater accuracy in taking the different bearings and amplitudes of objects: G, a slider made to fit the hollow of the trunk C, and to slide freely therein: H, the eye-piece, hinged to G at I, and which, when required, may be folded down so as to be entirely even with the upper surface of G, and the slider G, may be shut into the trunk C, or drawn out at pleasure, so that when the eye-piece H, is perpendicular to the horizon, it may be regulated so as to give the size desired to the drawing.

Fig. 2, the brass socket shown at B, fig. 1, for receiving
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the upper ends of the sectoral parts of the three-legged staff, and thereby forming the joints: KL, is a cylindric pin passing through the center of the brass piece B, which forms the sockets, having a male screw at the end L, which is received by the screw of the socket in the bottom of the trunk C. This cylindric piece K, is so fitted into the hole passing through B, as to allow the socket-piece B, to be turned round stiffly, so that the frame may be turned towards any object without risk of altering its position.

Fig. 3, the staff, shown as put together, and which is kept so by a cap at each end, and rings in the middle of it.

Fig. 4, a view of the upper side of the trunk C, the slider G, and the eye-piece H. In this geometrical representation, the slider is, drawn almost its whole length out of the groove which is made to receive it; and the eye-piece is folded down into the cavity on the upper side of the slider.

Fig. 5, is the front part of the frame.

Fig. 6, the back part of the same.

Fig. 7, a view of the box which contains the whole of the apparatus, except the three-legged staff; and the sketch book is also contained in the center of the box, so that the whole is rendered portable, and easy of carriage.

Fig. 8, is a screw-driver, for screwing the frame to the end of the horizontal trunk.

N. B. The stem *i*, is a tube, and the eye-piece *ff*, is fixed on a wire, which slides up and down within it to adjust it to the horizon.

The SILVER ISIS MEDAL was this Session voted to Mr. THOMAS BARBER, of Princes-street, Soho, for an Angulometer. The following Communication was received from him, and a Model of the Instrument is preserved in the Society's Repository.

SIR,

WITH this letter you will receive an instrument I have denominated an Angulometer, and which I take the liberty to beg of you to present to the Society of Arts, &c.

The principal uses for which it is intended are, the laying down and measuring of angles; and, as proportional compasses. It may also be used instead of triangular compasses, and the simple dividers. The grand object of the invention is to prevent the trouble and inconvenience of being obliged to produce the legs of angles of short radii to measure them, and of making the dots so much farther from the angular point in laying them down by the instruments now in use, than is wanted for the length of the sides.

How far I have succeeded, the Society will determine with their usual impartiality and acumen; should they think it worthy of their reward, I shall feel myself much honoured by the patronage of such able judges.

I am, Sir,

With great respect,

Your obedient humble Servant,

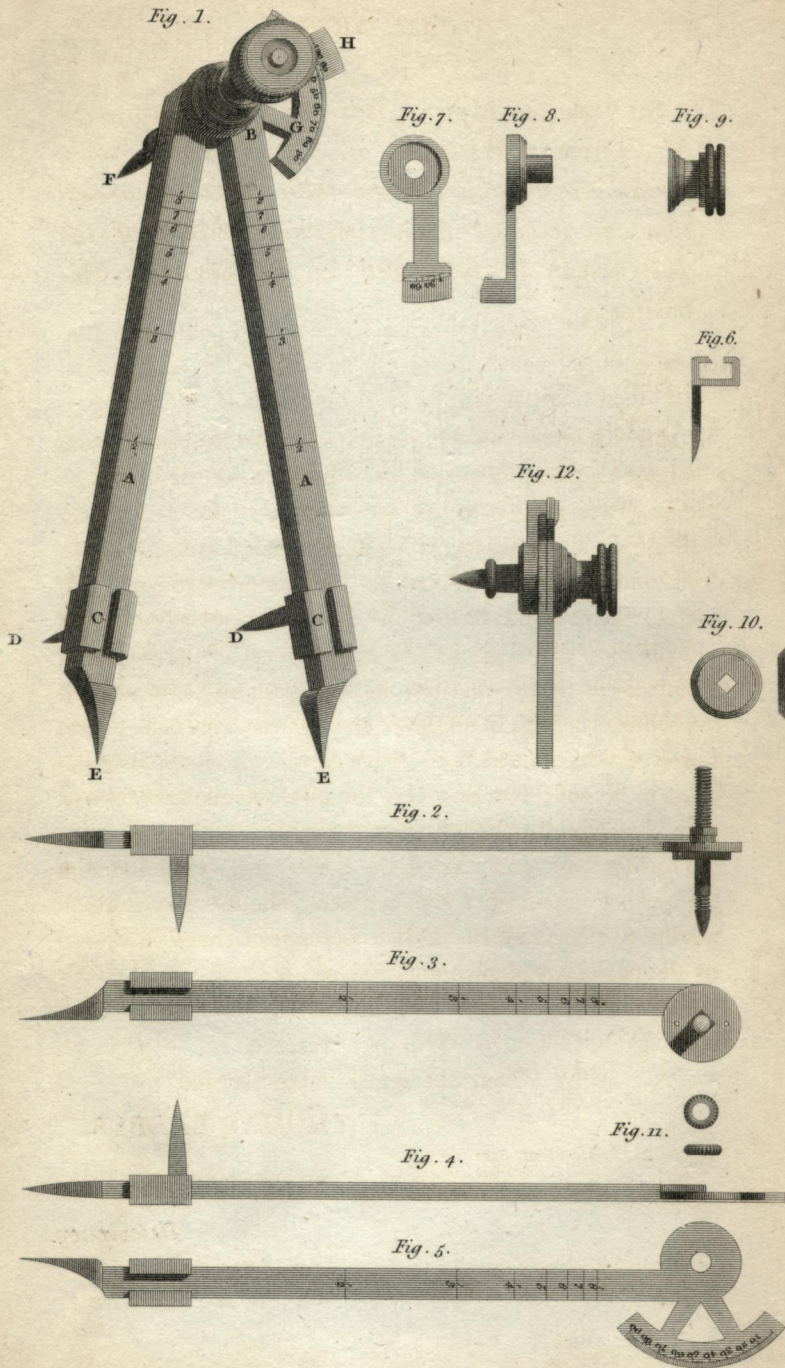
THOMAS BARBER.

No. 24, Princes-Street, Soho.

TO C. TAYLOR, M. D. SEC.

Description

Mr. Tho.^s Barber's Angulometer.



Description of the Angulometer.

THE Angulometer consists of two straight brass bars of any length, (those of the model are about five inches from the center of the joint), framed together by a single joint moving on a steel center similar to a common carpenter's rule, except that the external edges or sides form tangents to the circular cheeks or sides of the joint; the internal sides are made parallel to these and their bounding lines, if produced across the joint, would fall on the outside of the center, leaving the span of about 1-8th of an inch between them; this space is to allow for the thickness of two nonius sliders, which move the whole length of the bars, each carrying a steel point at right angles to the plane in which the bars move; these points are made like those of the common compasses, and of a length to the fancy of the user: at the end of each bar, and in the same plane, is fixed another steel point; the inner surfaces of both these pairs of points are close together, when the instrument is supposed to be closed. From the joint end of one of the bars springs an arc of a circle containing a little more than a quadrant, placed in such a manner as to allow of the slider passing close up to the joint; this circle, which is in the same plane with the broad surface of the joint, is divided into 90 degrees, and numbered with a double row of figures—the first row from 80 to 90 degrees off, and the second from 90 to 180. Its radius in the model is only one inch; but when great portability is not of such consequence, a radius of one and a half inches is better, for, the scale being more open, less care is necessary to avoid errors.

The leg to which this arc is attached, I shall, by way of

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distinction,

distinction, call the moveable leg ; the other, which carries the nonius, the base. The center is turned with a flanch, from the bottom of which proceeds a point of the same length as those in the sliders, and is used as the angular point ; the other end of the center after passing through the joint is filed square, and a collet fitted on it ; about a fourth of an inch that remains about the collet is tapped, and the whole secured together by a milled head screwed down upon the collet ; between this collet and the joint cheek of the base-bar, the moveable leg turns ; the other is prevented from having any motion on the center by two steady pins passing through the flanch into the joint.

Upon this center point a nonius is fixed by a spring pipe, so as to have a stiff motion upon it as a center, and secured in its place by a small collet ; the other end laps over the arcs in the usual way, and is divided so as to read to five minutes.

The arc being only 90 degrees, will of course measure no greater than a right angle ; but when the instrument is wanted to measure a greater, it is only necessary to push the nonius back as far as it will go, and read by the second row of figures ; it will then measure any angle that wants 5 of a semi-circle.

The nonius is prevented being pushed too far backward or forward by two pins fixed in the joint.

The divisions on the two bars are for dividing lines, in the same way as with proportional compasses.

To use the Angulometer.

To lay down an angle :—Hold the instrument in the left hand by the milled head ; grasp the end of the base with the
fingers

fingers of the right hand ; and, with the thumb, push the slider to any part of the base required ; set the slider on the moveable leg by the same way, and open the angulometer to the angle required ; then place it on the paper, gently press on the points, and draw the lines at pleasure.

To measure an angle :—Place the sliders on both legs as before, so that the points will fall on any part of the sides of the proposed angle ; then placing the angular point on the apex of the angle of the base slider, point on one line, and keep the other just clear of the paper, and with the finger and thumb press the instrument together till the moveable point will fall on the other side of the angle ; and the nonius will show the number of degrees and minutes.

As proportional compasses :—Place the indices on the sliders to the required No. on each leg ; and take the extent of the line to be divided between the end points, and the proportional part will be given by the distance between the two sliding points.

*Reference to the Engraving of Mr. THOMAS BARBER'S
Angulometer. Plate 12.*

Fig. 1, a general view of the angulometer, which answers the purposes of a protractor, a three-legged compass, and also a proportional compass.

A, A, the legs, jointed at B : B the joint, with a projecting pin from the under side, shown at F : C, C, sliders, moveable at pleasure upon the legs A, A, to which are attached the projecting points D, D.

The extreme point F, of the pin, is in the line of the axis of the center pin of the joint.

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The points E, E, the extremities of the legs A, A, and the points D, D, which project from the sliders, are all in a plane passing through the axis of the center-pin, when the instrument is shut ; and, when open at any angle, the point F, and the points D, D, are in a plane perpendicular to the axis of the center pin, quadrant of the same piece of brass with one of the legs : H, the vernier, in order to divide the degrees into minutes.

Fig. 2, one of the legs of the instrument, shown on the edge, with the center-pin and point at the end of it.

Fig. 3, side of the same.

Fig. 4, edge of the other leg.

Fig. 5, edge of the other leg, with the quadrant.

Fig. 6, one of the sliders, shown separately.

Fig. 7, the vernier, shown on the face, with the hole through which the center-pin passes.

Fig. 8, the vernier, shown on the edge.

Fig. 9, the milled headed nut, which tightened the instrument shown on the edge.

Fig. 10, washer under the milled headed nut, shown on the edge and face.

Fig. 11, a milled headed nut, next to the point.